DOCUMENT RESUME

ED 132 641 CS 501 587

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TITLE Student Success, Student Characteristics, and Method of Instruction: A Summary of Research and New Findings.
PUB DATE 76
NOTE 21p.; Paper presented at the Annual Meeting of the Speech Communication Association (62nd, San Francisco, December 27-30, 1976)

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS *Academic Achievement; *Communication (Thought Transfer); *Educational Research; Effective Teaching; Higher Education; *Speech Instruction; Speech Skills; Student Characteristics; *Success Factors; *Teaching Methods
IDENTIFIERS *Speech Communication

ABSTRACT

This paper summarizes research comparing the effectiveness of different methods of instruction, research findings relevant to an interaction between student characteristics and method of instruction in producing student success, and speech communication research relevant to predicting student success with a given method of instruction. Original research findings are presented which indicate that specific, but not general, speech communication competencies possessed at the beginning of a speech communication course are related to student success. (Author)

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STUDENT SUCCESS, STUDENT CHARACTERISTICS, AND METHOD OF INSTRUCTION: A SUMMARY OF RESEARCH AND NEW FINDINGS

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Instructional Development Division
Competitive Papers Program
Speech Communication Association
1976 Convention
San Francisco, California

Summary of Paper

This paper summarizes research comparing the effectiveness of different methods of instruction, research findings relevant to an interaction between student characteristics and method of instruction in producing student success, and speech communication research relevant to predicting student success with a given method of instruction. Original research findings are presented which indicate that specific, but not general, speech communication competencies possessed at the beginning of a speech communication course are related to student success.

CS 501 587

STUDENT SUCCESS, STUDENT CHARACTERISTICS, AND METHOD OF INSTRUCTION: A SUMMARY OF RESEARCH AND NEW FINDINGS

One of the most significant areas of educational development during the 1960's and 1970's has been the attempt to adapt instructional programs to the needs and abilities of individual students while at the same time providing educational opportunities for large numbers of students. Other eras have witnessed individualized instruction for a limited number of students or a single standardized instructional program for large numbers of students. But the concept of efficient, individualized instruction for large numbers has only recently been given attention. This goal, although not yet achieved, now seems reasonable for students in the very near future.

The goal of individualizing instruction has received impetus from research findings during the past fifty years comparing the effectiveness of different methods of instruction. The failure to find consistent differences in the effectiveness of various methods led to the conclusion that some students do better under one method while others do better with a different method of instruction. In statistical terms, we would expect to find an interaction between student characteristics and method of instruction in producing student success in an educational program. If the nature of this interaction can be determined, educators would be able not only to provide different methods of instruction to meet different needs but also to counsel students concerning which methods they should utilize.

In this paper I will first summarize the research comparing the effectiveness of different methods of instruction. Second, I will summarize some of the research findings relevant to an interaction between student

characteristics and method of instruction in producing student success. Third, research in speech communication relevant to predicting student success will be summarized. Finally, I will present findings of a research project designed to determine the relationship between student success in a college level speech communication course and pre-existent speech communication competencies.

Comparisons of Instructional Methods

Research comparing the effectiveness of various methods of instruction has been summarized in a variety of other sources. In this paper I will not attempt to duplicate those efforts. Rather, the major findings of the more recent summary studies will be presented.

In 1968, Dubin and Taveggia reanalyzed the data presented by almost one hundred studies comparing the effectiveness of a variety of instructional methods.[1] The specific comparisons made by Dubin and Taveggia were (1) lecture versus discussion, (2) lecture versus lecture and discussion, (3) discussion versus lecture and discussion, (4) supervised independent study versus lecture, and (5) unsupervised independent study versus supervised independent study. Dubin and Taveggia used course examination scores as the measure of student success in a course. Their reanalysis of data revealed significant differences between methods of instruction in a small number of studies. In fact, the number was so small that the differences could have occurred by chance alone. Furthermore, they contended that the "significant" studies presented conflicting findings to the extent that for every study supporting the superiority of one method over another a refuting study could be found. Dubin and Taveggia concluded:

> The results of our intensive reanalysis of data on comparative college teaching methods make it very clear that our intended goal

> has been achieved. We are able to state decisively that no particular method of college instruction is measurably to be preferred over another, when evaluated by student examination performances. We may also conclude that replication of the 91 studies examined in detail in this survey would not produce conclusions different from our own. . . . We are convinced that approximately 40 years of research speaks the truth. It is now time to turn to a reconceptualization of the analytical problem.[2]

A second extensive summary of research on the effectiveness of different methods of instruction was done by McKeachie in 1970.[3] McKeachie's summary included a comparison of (1) lecture method versus discussion method, (2) student-centered discussion versus instructor-centered discussion, (3) student-led discussions versus teacher-led discussion or lecture, and (4) independent study versus more conventional methods. McKeachie's summary utilized three criteria for determining student success in a course: factual knowledge (usually as determined by a course examination), higher level retention and thinking, and student attitude or motivation.

In comparing lecture methods with discussion methods, McKeachie found seventeen studies that compared the two methods using a factual exam as the success criterion. Only two of these studies found a significant difference, and both of these studies favored the lecture method. Six studies compared the two methods using higher level retention and thinking as the success criterion. Three of these studies found significant differences favoring the discussion method. Eight studies compared lecture and discussion using student attitudes and/or motivation as the success criterion. Only two found significant differences, and these differences favored the discussion method.[4]

McKeachie also reviewed studies comparing student-centered discussion (instructor facilitates discussion but does not lead it) with instructor-centered discussion (instructor leads discussion). Five studies compared the

two methods using factual knowledge as the success criterion. Three found significant differences between the two methods. However, two studies favored the student-centered discussion method and one favored the instructor-centered method. Five studies compared the two discussion methods using "higher level cognitive" development as the success criterion. Only one significant difference was found, and this difference favored the student-centered discussion. Twenty-two studies used student attitude or motivation as the success criterion. Only four found significant differences favoring the student-centered discussion.[5]

Twenty-seven comparisons were made between the student-led discussion method and teacher-led discussion or lecture. Five of these comparisons (spread across the three success criteria) favored the student-led discussions. All of the other twenty-two comparisons yielded nonsignificant differences.[6]

The final comparison dealt with by McKeachie compared independent study with more conventional methods of instruction. The results of the studies summarized by McKeachie can best be described as conflicting. In some cases independent study resulted in better scores on tests for factual knowledge; in other cases more traditional methods of instruction produced better results. Similar findings have been reported when other success criteria have been used.[7]

Another review of research comparing different instructional methods was presented by Schramm. He summarized studies dealing with the effectiveness of televised instruction versus other methods. In the one hundred studies he summarized, eighty-four found no significant differences in achievement.[8]

It is important to note that the concept of mastery learning has not yet been used as an independent variable.[9] However, based on the previous

research with other methods of instruction, the probability that the use of mastery learning methodology would significantly affect learning seems quite low.

McKeachie has argued quite strenuously that although results of previous research do not support a general superiority of one method of instruction over another, differences in effectiveness may still exist. Specifically differences in effectiveness of instructional methods may interact with student characteristics. That is, some students may be more successful with one method of instruction while other students will do better with another.

Student Characteristics -- Methods of Instruction Interaction

McKeachie's 1970 review summarized a small body of research concerning the interaction between student characteristics and method of instruction. McKeachie's summary suggests an interaction between method of instruction and the following student characteristics: intelligence, cognitive style, authoritarianism, sociability, affinity, and anxiety.[11] Other studies have also reported the existence of an interaction between student characteristics and method of instruction. Doty[12] as well as Hoover, Gruber, and Terrell[13] found that successful students in conventional lecture courses were characterized by moderate achievement and social needs and low creativity whereas students who were successful in classes taught by small discussion groups were characterized by high creativity and/or high social needs. Block[14] found that mathematics achievement levels of students at the time they began a course predicted their achievement level at the end of a course if they had been instructed by conventional methods. However, incoming achievement levels did not predict ending achievement levels if students had been instructed with

a mastery learning method. In other words, students with poor mathematics backgrounds were more successful in mastery learning classes than in conventional classes whereas students with high achievement levels were neither more nor less successful.

Davis[15] found that English students who were successful (in terms of gain scores) in a mastery learning class were characterized as having: (1) low incoming scores on a writing test, (2) low incoming scores on a reading test, (3) low incoming scores on two ACT measures, (4) a strong preference to be instructed through text book methods, and (5) a strong preference to choose their own essay topics. In some past hoc chi-square analyses Davis found that students who preferred to consult written material as opposed to students who preferred to consult another person orally were more apt to fail in the conventional mode of instruction than in the mastery learning mode. Also, mastery learning students who either strongly agreed or strongly disagreed with the statement "I learn a subject better when I can discuss it with other students in my class" tended to succeed more frequently than did their counterparts in a conventional class. Conventional students who did not have such strong feelings about the statement tended to succeed more frequently than did their counterparts in the mastery learning classes. Finally, Davis found that conventional students who agreed that "social recognition" was important to them were more apt to succeed in the conventional mode than were students who did not agree that social recognition was important to them.

Other studies, however, have not found an interaction between student characteristics and method of instruction. Goldberg[16] found no significant interaction between student personality characteristics and success

structured versus unstructured classes. Tallmadge and Shearer[17] reached a similar conclusion. Cronbach and Snow's[18] review and reanalysis of a number of student aptitude and instructional method interaction studies led them to conclude that generalizations cannot yet be made concerning such interactions. Their conclusion, however, was based to some extent on methodological problems of previous studies. They suggested that research efforts to find such interaction be continued with improved methodology.

McKeachie, in noting these research efforts which have failed to support the existence of an interaction between student characteristics and instructional mode, explains them as follows:

> My own rationalization is that teaching and learning is an enormously complex business in which so many variables are involved that interaction effects, like methods effects, pop up only a little way above the apparent noise generated by other variables. We need need to do more and better research, but I doubt that any new models or new variables will suddenly sort out all the variance into large, meaningful categories.[19]

Davis tends to agree with McKeachie and make a number of recommendations for further research which may account for a greater percentage of the variance. Specifically, interaction between teacher characteristics and method of instruction needs to be examined. Additional student characteristics also need to be considered.[20] Beyond these recommendations, more effort needs to be devoted to predicting student success with method of instruction held constant. It is with regard to this last suggestion that we find some research conducted in speech communication. In this next section we will review research attempting to predict student success in speech communication.

Speech Communication Research

Seven studies dealing with method of instruction and student

characteristics as determinants of student success in speech communication courses will be dealt with. The first three of these studies compared the relative effectiveness of various methods of instruction. The last four dealt with the relationship between student characteristics and student success.

Ewing[21] compared the effectiveness of an individual speaking method and a group speaking method of instruction. The individual spaking method emphasized the preparation and delivery of speeches but did not allow group discussion or questions from listeners. The group method emphasized group discussion activities and audience questioning and criticism of speakers after they had delivered speeches. Although there were no significant differences at the end of the courses on an interpretation of data test, a social problems test, and a speech attitude test, there was a significant difference on a persuasive speaking test favoring the group speaking method.

Becker and Dallinger[22] compared three methods of communicating the "content" of a speech communication course. The three methods they used were the normal or traditional method which places primary responsibility on the instructor, a television method in which experts in various aspects of speech communication presented the content, and a reading method in which students were given bibliographies of assigned and optional reading to be done outside of class. They found no differences at the end of the course on a wide range of criterion measures such as the "Brown-Carlson Listening Comprehension Test," a multiple-choice examination covering principles of communication skills, an argumentative speech, and a multiple-choice questionnaire on attitudes toward communication. There were,

however, differences in the type of course students preferred. The normal or traditional course was most frequently preferred. There was also a tendency for students to be more favorable toward the type of course they had taken.

Faules, Littlejohn, and Ayres[23] compared the effect of three different courses on speaking effectiveness. Two of the courses emphasized public speaking and the third emphasized communication theory. The two public speaking courses differed on the kinds of topics and the emphasis placed on research and analysis of issues. The dependent variable in the study was speaking effectiveness as measured by expert and nonexpert judges' ratings at the end of the course. Results indicated that the public speaking courses produced more effective speakers than the communication theory course.

The first study which attempted to predict student success in speech communication courses from identifiable student characteristics was conducted by Kibler, Kelly, Gibson, and Gruner.[24] They took samples of students' written and oral communication behavior at the beginning of a semester and related their obtained data to final course grades. They found a significant relationship between the number of syllables used in a public speech prior to instruction and the course grade. The relationship was a fairly strong one and accounted for approximately 40% of the variance. Even so, more than half of the variance was not accounted for. But certainly this variable should receive more attention.

Two studies were reported by Judd and Smith[25] which attempted to predict course grades from California Personality Inventory variables, SAT verbal scores, SAT math scores, and high school quartile rankings. In the first

study they found that flexibility correlated negatively with course grades ($r = -.42$) and high school quartile rankings correlated positively ($r = .45$) with course grades. In the second study they found that SAT verbal scores correlated positively with course grades ($r = .42$) as did high school quartile rankings ($r = .24$). Multiple correlations were not performed in Judd and Smith's data so that it is difficult to say how much of the variance was accounted for; however, the size of the obtained r's makes it clear that the percentage of variance accounted for was not great.

A third study was conducted by Wall.[26] He studied the relationship between two measures of success and SAT verbal scores, SAT math scores, percentile rank in high school graduating class, and high school teacher ratings of the student on a variety of dimensions such as "participation in discussion," "depth of understanding," and "personal responsibility." His two measures of success were course grades and final examination grades. The only significant (at the .01 level) correlation he found was between the SAT verbal score and final examination scores. Wall questioned the reliability of final course grades as a criterion for success and the validity of final examination grades as the criterion.

A fourth study to be considered was conducted by Burgoon.[27] He studied the relationship between willingness to manipulate other people and success (in terms of course grades) in two different kinds of basic speech communication courses. He found that successful students in a communication course consisting primarily of small group and dyadic communication exercises exhibited a willingness to manipulate other people. Successful students in a public speaking course did not exhibit this characteristic. The nature of Burgoon's statistical analysis does not

allow us to determine the strength of the relationship found by Burgoon. Further, as Burgoon himself admits, these results may be somewhat difficult to generalize to other situations. It almost seems as though the manner in which grades were determined in the communication courses predetermined the outcome of the study. Burgoon point to no objective criteria used to determine grades in the communication courses. Rather, he states, "Generally for a student to succeed in the communication course, it was necessary that he have impact on other students and make his instructor aware of that impact." With course grades assigned on such bases, it is little wonder that a willingness to manipulate others was a factor in determining success.

In reviewing the research conducted in speech communication, we should note that support is provided for the notion that no one method of instruction can be shown to be superior to another for all kinds of students. Although the Ewing and Faules, et al, studies found some significant differences, these studies actually compared different types of courses rather than different methods of instruction. The four studies attempting to predict student success have shown that some student characteristics are related to student success. The most important student characteristics thus far discovered seem to be number of syllables used in a public speech prior to instruction, SAT verbal scores, and high school quartile rankings. However, these variables do not seem to be an adequate set of predictors. Other variables need to be added to the list before we attempt to determine how the list of predictors changes for different methods of instruction.

During the Fall Semester, 1975, a research project was initiated to determine variables related to student success in the basic speech communication course. The remainder of this paper will present research findings from the initial phase of this project. The initial phase sought to determine the relationship between student competencies in speech communication prior to beginning the course and success in the course.

Research Findings

Before the results of the research presented here can be fully understood, we must have some insight into the nature of the course utilized in the study. The course might best be described as a "hybrid" course focusing on interpersonal communication, interviewing, group discussion, and public speaking. The course made use of behavioral objectives and criterion-referenced evaluation. Most of the sections were taught by graduate assistants; however, a common syllabus was used by all the sections. The syllabus specified all the objectives students were to achieve as well as the criteria which was used to evaluate student performance. All course projects included both written and oral phases; ten per cent of the course grade was based on quizzes and a final examination. Each section had from twenty-five to thirty students and met three class-hours per week for fifteen weeks.

Operational Definitions and Measuring Instruments. Speech communication competencies of students prior to taking the course were measured by means of two different measuring instruments. One of these instruments, the Communication Self-Report Inventory (CSRI), measured the student's communication sensitivity; the other instrument tested the student's listening ability and the amount of information he possessed directly

relevant to the concepts covered in the course.

The CSRI consisted of forty forced-choice items. The items were designed to determine whether the subject exhibited the attitudes and behaviors of a Pattern I Communicator or a Pattern II Communicator as described by Rogers and Roethlisberger.[28] Briefly, a Pattern I Communicator assumes that what takes place in communication is essentially logical, that words in themselves (apart from the people involved) mean something, and that the purpose of the interaction is to get the other person to see things from one's own point of view. A Pattern II Communicator assumes that what is taking place between two individuals is an interaction of sentiments, that the other person (not his words in themselves) means something, and that the object of the interaction is to give the other person an opportunity to express freely his differences. The philosophy underlying the CSRI assumes that the Pattern II Communicator is a more sensitive communicator than the Pattern I Communicator. Other aspects of communication sensitivity as defined by the CSRI include a strong reliance on nonverbal cues to interpret how a communicator's verbal message should be interpreted, a strong belief in the importance of effective and empathic listening, openmindedness, and a concern for others.

The other measure given at the beginning of the course consisted of thirty-five multiple-choice items. Five of these items were listening recall items, five dealt with interpersonal communication, five dealt with information about interviewing principles and techniques, ten dealt with information about group discussion, and ten dealt with public speaking.

Student success in the speech communication course was operationalized in terms of the total number of points received in the course. Because

such a measure suffers from a lack of inter-judge reliability, the students in each section were divided into quartiles based on the number of points they had earned. This increase reliability because different instructors seem more likely to be in agreement on gross judgments such as quartile rankings than they are on the specific number of points a given student has earned.

Procedures, Data Analysis, and Results. During the first week of the semester, all students in the course were asked to respond to both of the measuring instruments used in this study. The CSRI appeared first followed by the 35-item listening and speech communication test. Students were told that the tests were being administered as a diagnostic and advanced standing test. Students who did well on parts of the 35-item test were given credit for one or more of the course quizzes. No student, however, received more than 20 points credit (out of a total of 1000 points possible in the course).

To reduce the amount of time and cost involved in data analysis, total of ten sections (out of thirty) were selected using a table of random numbers to serve as the sample for this study. The total number of subjects for the study was 248 (62 per group).

Because student success in the course was defined in terms of quartile rankings, student success was used as the independent variable for data analysis purposes. Scores on the two measures of student competency in speech communication prior to the course were used as dependent variables in a one-by-four analysis of variance design. Although it would have been more elegant to test the relationship between prior competencies and student success using either the Pearson r or by using student success as the dependent variable in an analysis of variance design, the use of quartile

rankings ruled out these possibilities. To have used the raw scores would have insured nonsignificant results because of the lack of inter-judge reliability of the scores.

Means of the four groups on both the CSRI and the speech communication test are presented in Table 1.

TABLE 1

MEANS OF FOUR GROUPS ON CSRI AND SPEECH COMMUNICATION TEST

Test	1st Quartile	2nd Quartile	3rd Quartile	4th Quartile
CSRI	19.871	19.952	20.065	18.565
Speech Comm.	20.419	18.613	17.548	17.145

When the CSRI scores of the four groups were compared (see Table 2), the F ratio was nonsignificant; that is, groups varying in terms of success in the course were <u>not</u> significantly different from each other on communication sensitivity at the beginning of the course.

TABLE 2

ANOVA FOR FOUR GROUPS ON CSRI

Source	Degrees of Freedom	Sums of Squares	Mean Squares	F
Between	3	172.6	57.533	1.358
Within	244	10304.9	42.2331	
Total	248	10477.5		

The analysis of data for the relationship between student success and listening and speech communication competencies (see Table 3) resulted in a significant F ratio. A Newman Keuls post hoc analysis was performed.

TABLE 3

ANOVA FOR FOUR GROUPS ON SPEECH COMMUNICATION TEST

Source	Degrees of Freedom	Sums of Squares	Mean Squares	F
Between	3	397.9	132.633	10.303*
Within	244	3140.9	12.873	
Total	248	3538.8		

*Significant at .01 level

This analysis indicated that the first quartile, or the most successful students in the course, possessed a higher degree of specific speech communication competencies at the beginning of the course than did students in the other three quartiles. Although the means for the second and third quartiles are higher than the mean for the fourth quartile, the difference is not significant.

Discussion of Results and Implications for Further Research. The results of this study indicate that general communication competency such as that measured by the CSRI has no direct relationship to student success in a basic speech communication course. More specific competencies in speech communication principles and techniques, however, are related to student success. Specifically, students who are most successful in the course seem to have started with greater listening skills and more information about speech

communication principles and techniques. Future research attempting to predict student success in the basic speech communication course should use the listening and cognitive information variable as one predictor. Previous findings indicate that variables such as the number of syllables used in a public speech prior to instruction, high school quartile rankings, and SAT verbal scores should also be used.

One basic problem which seems to remain in research attempting to predict student success is finding a satisfactory definition for the student success variable. The definition used in this study, quartile rankings within a section, is a possibility. However, it is not a completely satisfactory solution to the problem because the data obtained with this solution does not permit the use of many of the tools of statistical analysis which would be appropriate with continuous data.

Only when we are able to account for a considerable amount of the variance in a predictive model of student success when one instructional method is used can we begin to make progress on determining how predictive models should be altered to predict student success with different methods of instruction. Only when such models are available will we be able to truly meet the needs of each individual student.

End Notes

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[2]Ibid., p. 23.

[3]W. J. McKeachie, Research on College Teaching: A Review (Washington: ERIC Clearinghouse on Higher Education, 1970).

[4]Ibid., p. 4.

[5]Ibid., p. 5.

[6]Ibid., p. 7.

[7]Ibid., pp. 8-9.

[8]W. Schramm, "The Research on Programmed Instruction: An Annotated Bibliography," Washington: U. S. Office of Education, Bulletin Number 35, 1964.

[9]Mastery learning requires that course objectives be arranged hierarchically and that students must achieve lower level objectives satisfactorily before attempting new objectives. In other words, if a student does not meet an objective on an initial assessment, he is permitted/required to continue his efforts on the same objective until he does perform satisfactorily.

[10]McKeachie, p. 10.

[11]Ibid., pp. 10-12.

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[25]L. R. Judd and C. Smith, "Predicting Success in the Basic College Speech Course," The Speech Teacher, XVIII (January 1969), 13-17.

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[28]C. R. Rogers and F. J. Roethlisberger, "Barriers and Gateways to Communication," Harvard Business Review, XXX (July-August 1952), 46-52.